review of issues in

financing
the
canada
pension
plan

Ontario

Ministry of Treasury, Economics & Intergovernmental Affairs

review of issues in
financing the canada pension plan

Ontario's Contribution to the Continuing
Review of the Canada Pension Plan

Hon. Charles MacNaughton

PENSIM: Canada Pension Plan Simulation
Model (Ontario Tax Study 6)

Hon. Charles MacNaughton

Review of Issues in Amending the Canada
Pension Plan

Hon. John White

Ontario Proposals for Amending the Canada
Pension Plan

Hon. W. Darcy McKeough

Review of Issues in Financing the Canada
Pension Plan

PREFACE

As part of Ontario's contribution to the continuing review of various aspects of the Canada Pension Plan, Ontario published in the fall of 1972, two documents titled, PENSIM: Canada Pension Plan Simulation Model and Review of Issues in Amending the Canada Pension Plan. Following on this work, the Province presented Ontario Proposals for Amending the Canada Pension Plan in April 1973 at the Federal-Provincial Ministers of Welfare Conference in Ottawa. The federal-provincial discussions that ensued resulted in a number of substantial changes being made to the Canada Pension Plan. Though the financial implications of these changes were recognized, they were considered of secondary importance compared to the social objectives that were being achieved.

Nevertheless, these amendments have accelerated the need for a thorough review of the CPP financial structure. Like the earlier review paper, this document is an initial contribution to understanding, from the provincial point of view, the general issues involved in financing the Canada Pension Plan. It should not be viewed as a statement of an Ontario position.

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ABSTRACT

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I. SUMMARY

Recent amendments to the Canada Pension Plan will have a large financial impact on the CPP by reducing the size of the total accumulated funds by $18 billion. This will cause the fund to run down 19 years earlier. From the provincial viewpoint, these changes mean that the provinces will lose a key source of borrowing in the early 1980's.

At the present time the Canada Pension Plan is partially funded. Any changes to this arrangement will impact on contribution rates, the flow of funds to the province, the economy and the financial markets. Contribution rate changes also have important implications for the equity of contributions in terms of intergenerational subsidies and tax incidence.

Within the traditional funding mechanisms there are three possible funding alternatives: full, partial or pay-as-you-go. Each method has unique characteristics. In terms of provincial financing, full funding ensures very large net cash flows in the early years. It also ensures that intergenerational subsidies are minimized. However, full funding requires by far the highest contribution rates. Pay-as-you-go financing, on the other hand, provides no source of funds for provincial borrowing. It requires the largest contribution rates in the short run but also results in larger intergenerational subsidies. Partial funding lies between the two extremes of full funding and pay-as-you-go. Each of these conventional funding techniques has the common characteristic of requiring the same contribution rate in the long run. When this is reached net cash flow will be perpetually zero. Another non-funding avenue is available through general revenues, for example, the current funding of Old Age Security payments. Since there are no contributions, there is no fund and, as a result, the largest intergenerational subsidies occur.

The rate of return on CPP debentures is another question that must be addressed. Current and past CPP borrowings have occurred at favourable rates and it has been argued that because of this, the fund has been denied revenues which could be used for financing benefits instead of increasing the contribution rate. While this may be the case, the issue is a minor one since, under the current contribution rate, raising the interest rate by a full percentage point (more than the average differential between market and CPP rates) does little to increase or lengthen the lifetime of the fund. The interest rate does not affect net provincial cash flow.

The financing of the CPP requires decisions to be made among a number of conflicting objectives. Full funding minimizes subsidies but increases costs. For contributors pay-as-you-go funding minimizes short-run costs but maximizes subsidies. Partial funding represents a trade-off between the two. In any of these systems, the contribution structure is grossly inequitable because of its regressive nature. Changes could be considered which would offset this negative feature.

The basic issue in amending the CPP financial structure is the extent of the role that the Plan will play as a financing alternative for the provinces.

II. INTRODUCTION

In recent years* the Canada Pension Plan (CPP) has undergone a number of changes, some of which have fundamentally altered the structure of the Plan and others which have been more superficial. The financial implications of these changes were of secondary importance relative to the social objectives that were achieved. Two of these amendments, namely full price escalation and the removal of the earnings test, will have a large financial impact on the CPP. In terms of the total accumulation of funds, there will be an approximate decrease of $18 billion with an exhaustion point 19 years sooner. A more revealing indicator is net provincial cash flow, which turns around five years earlier, in 1983.

As a result, the CPP requires a review of its financing structure much earlier than if the Plan had not been amended. It is the purpose of this document to examine the current funding and contribution arrangements of the Canada Pension Plan and to explore directions that future policy may take. This paper does not attempt to formulate policy in this regard, but instead, it should serve as a background document for subsequent policy analysis. In the discussion presented, the financial issues are discussed in the context of their social and economic implications.

It is clear from the outset of this examination that when the CPP was in the design stage in 1964 and 1965, very little consideration was given to the implications of its long-run financing. Consequently, in 1976, with the Plan just out of the transition phase and with a fund of over $9 billion, the provinces are faced with making the hard decisions necessary to build a sound financial structure for the CPP.

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* Effective January 1, 1974

- the YMPE began escalating at 12.5 per cent per annum until it reaches the average wage of the industrial composite;
- the YBE is to be calculated as 10 per cent of the YMPE; and,
- the benefits in pay began escalating annually by the full increase in the Consumer Price Index.

Effective January 1, 1975

- equal treatment of male and female contributors and beneficiaries was established; and,
- the retirement and earnings tests were eliminated.

Other changes were made for increased administrative efficiency.

III. BACKGROUND

The CPP operates as a partially funded pension plan, universal to those Canadians who earn wages and salaries above the Year's Basic Exemption (YBE). In the spectrum of funding, from paygo* to fully funded, the CPP lies closer to the paygo funding system. In 1974-75, the actual paygo contribution rate (employer plus employee) was 1.25 per cent and the fully funded rate was in excess of 8.3** per cent, therefore the current 3.6 per cent tends more to the unfunded end of the funding spectrum. The paygo method, as its name implies, meets its current liabilities out of current revenues with the result that no fund exists. An example of a plan which operates in this unfunded manner is the OASDHI system in the U.S.A. With a fully funded plan, a large fund exists which guarantees all of its future liabilities. Numerous examples of funded plans exist in the provinces which have enacted uniform Pension Benefits acts.

The viability of a paygo plan is based on the relationship that current revenues always exactly meet current liabilities. If for some reason current expenditures exceed current revenues, the plan is no longer solvent unless revenues are increased or expenditures decreased. With a fully funded plan, no such relationship exists. Instead, discounted accumulated revenues must exactly meet discounted accumulated liabilities. Two important differences between the two methods are the degree of intertemporal transfers among con- tributors, and the presence of a fund.

The Canada Pension Plan is a hybrid of these two financing methods. While revenues currently far exceed expenditures, the fund that is accumulated is not sufficient to meet all future contingencies. In other words, the fund will run down before all current contributors have received their entitlements. In terms of transfers, the subsidies paid to CPP beneficiaries will be less than if the Plan were operating on a paygo basis.

When the CPP was established in 1965, provision was made to lend excess revenues on a monthly basis to the participating provinces with any unborrowed portions to be picked up by the federal government. Excess revenues are loaned to the provinces on a prorated basis which is a function of their

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* Pay-as-you-go will be shortened to "paygo" throughout this document.

** The paygo rate in 2025, the limit of the forecast, is 8.3 per cent and still increasing.

ten-year contribution history. In return, the provinces issue non-marketable,
non-transferable, non-assignable, fixed-term securities written for terms not
to exceed 20 years. The rate charged on these securities, or conversely, the
rate earned by the CPP, is a weighted average of yields for the first three
days of a given month for Government of Canada bonds with 20 years or more to
maturity. Funds not picked up by the provinces are held in the CPP operating
fund and earn interest calculated on a daily basis using the three-month Treasury
Bill yield during the month, less one-eighth of one per cent.

Table I lists the borrowing by each province since the inception of
the Plan. It demonstrates the remarkable growth in the investment fund over
the period, to its present $9.4 billion. More interestingly, it shows that
relative provincial contributions have remained very stable and that there
have been no large shifts in earnings in the distribution.

Table II, using Ontario as an example, demonstrates one of the current
problems with CPP financing. While gross borrowing for every province, including
Ontario, has been growing at a steady rate, likewise the interest payments to
the CPP have been increasing, but at a faster rate. As a result, net cash flow
has shown very slow overall growth. The ratio of interest payments to gross
borrowing, which indicates the portion of borrowed funds which are essentially
recirculated to finance CPP interest payments, is growing at a very fast rate.
In 1975-76, Ontario used 49.8 per cent of its CPP borrowing capacity just to
meet CPP interest payments, and in 1976-77 this figure will exceed 50 per cent
because of the high prevailing borrowing rates. Obviously, as this ratio
approaches 1.0, net cash flow approaches zero. Borrowing at this point exactly
meets interest payments.

Computer forecasts indicate that the turnaround point for net
provincial cash flow will be early in the 1980's.* In terms of the fund's
exhaustion, it could be argued that net provincial cash flow is not the relevant
indicator to judge when the contribution rate should be changed, since the fund
could continue to finance benefits for several years after net provincial cash
flow becomes negative.

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* Ontario forecasts indicate 1983 as the turnaround date and federal government
  forecasts the year will be 1982.

CANADA PENSION PLAN INVESTMENT FUND INVESTMENTS BY PROVINCE IN DESCENDING ORDER TABLE 1
($ million)

Province	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	All Fiscal Yrs. to Date
Ontario	20.1	332.6	375.9	412.0	445.8	476.0	498.3	536.4	606.6	701.8	784.1	5,189.6
	.58*	.57	.57	.56	.55	.55	.55	.55	.55	.55	.55	.55
British Columbia	5.0	84.4	96.6	107.5	117.2	125.1	131.2	141.5	161.7	189.1	213.9	1,373.3
	.14	.15	.15	.14	.14	.14	.14	.14	.15	.15	.15	.15
Alberta	3.1	51.1	59.2	68.4	77.1	82.3	87.1	94.6	108.2	126.6	143.4	901.0
	.09	.09	.09	.09	.10	.09	.10	.10	.10	.10	.10	.10
Manitoba	2.1	34.9	39.4	42.3	47.7	51.5	53.7	57.4	64.5	74.5	83.4	551.3
	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
Saskatchewan	1.4	24.5	29.7	35.9	40.4	42.9	42.7	43.2	47.8	55.6	62.6	426.7
	.04	.04	.04	.05	.05	.05	.05	.04	.05	.05	.04	.05
Nova Scotia	1.2	21.4	25.2	29.2	31.6	34.0	35.7	38.6	43.8	50.9	57.3	369.0
	.03	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
New Brunswick	1.0	16.7	19.3	21.8	24.2	25.8	26.8	28.8	32.8	38.3	43.2	278.7
	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
Newfoundland	.7	11.0	12.0	14.2	15.6	16.8	17.6	19.0	21.7	25.8	29.4	183.8
	.02	.02	.02	.02	.02	.02	.02	.02	.02	.02	.02	.02
Prince Edward Island	.1	1.9	2.3	2.9	3.2	3.5	3.6	3.8	4.3	5.3	6.0	36.9
	-	-	-	-	-	-	-	-	.01	.01	.00	.00
Quebec **	-	.4	1.9	2.4	3.1	5.1	6.6	8.0	8.1	7.9	8.0	51.4
	-	-	-	-	-	.01	.01	.01	.01	.01	.01	.01
Residual (Canada)	.1	1.8	3.8	5.6	4.1	5.4	6.5	7.1	7.9	9.1	10.2	61.7
	-	-	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
TOTAL	34.9	580.7	665.3	742.2	809.8	868.5	910.0	978.3	1,107.4	1,284.9	1,441.5	9,423.4

* Ratio of provincial borrowing to total available funds. Totals may not add to 1.0 due to rounding.

** Residents of Quebec working in another province contribute to the CPP.

ONTARIO'S NET CASH FLOW WITH RESPECT TO CPP BORROWING   TABLE II
($ million)

Fiscal Year	(1) Gross Borrowing	(2) Cumulative Interest Payments	(3) Net Cash Flow	Ratio of (2) : (1)
1965-66	20.1	1.1	19.0	.055
1966-67	332.6	19.2	313.4	.058
1967-68	375.9	41.2	334.7	.110
1968-69	412.0	68.8	343.2	.167
1969-70	445.8	102.9	342.9	.231
1970-71	476.0	140.0	336.0	.294
1971-72	498.3	175.3	323.0	.352
1972-73	536.4	214.7	321.7	.400
1973-74	612.4	260.6	351.8	.426
1974-75	701.8	320.6	381.2	.456
1975-76	784.1	390.7	393.4	.498

The question should be regarded from another perspective. When net provincial cash flow equals zero, the Plan has become a paygo plan if contribution rates subsequently increase just enough each year to finance the increased benefits. This could be the transition point for a new financing mechanism. Subsequent chapters will discuss various funding mechanisms for the CPP and their social and economic implications.

IV. THE MECHANICS OF FUNDING

This section considers the mechanics of the current funding system
and three other conventional funding systems. The three methods discussed
do not radically alter the basic structure of the CPP except for the level
of the contribution rate in the years to come. Before these funding systems
are discussed, the concept of actuarial soundness is explained to set a
background for the funding systems.

a. Actuarial Soundness

Actuarial soundness is a concept that receives much publicity but
which is relatively meaningless unless the circumstances surrounding the
definition are clearly outlined. For instance, in the strictest sense of
the definition, the CPP is actuarially very unsound indeed. If all contrib-
utors immediately terminated contributing, no new contributors were allowed in
the Plan and the scheduled benefits were paid out, very few contributing today
would actually receive benefits. This definition assumes the termination of
the CPP, much like a firm going bankrupt, which makes it a very strict one.
Actuarial soundness in this sense is widely used in the private sector
where the incidence of bankruptcy is presently much higher than in the
government sector. If the CPP were actuarially sound in this way, it would
ensure that contributors receive their fair share of entitlements in the event
of termination of the Plan.

If the CPP is viewed as an ongoing entity and governments can be
certain that various inputs to the Plan will remain stable, it can be said that
the CPP is currently actuarially sound. Under this type of definition a paygo
plan can be judged as actuarially sound. Since the taxing power of a government
is always a de facto guarantee of a plan's actuarial soundness, this question
almost becomes academic. Scenarios of bankruptcy of a government would be the
only limiting case. Notwithstanding that event, there is a social question of
what type of subsidies should occur within the Plan itself because of the
differing contribution structures that can be implemented and a financial
question of the desired level of borrowing.

b. The Current System

Figure I exhibits the future of the CPP if the current funding
system is left unchanged. The uppermost portion of the graph shows the
growth of the revenue and expenditure components of the Plan over the next

few decades*. It can be seen that the current 3.6 per cent overall contri-
bution rate is not sufficient to finance the benefit stream after 1983 since
at point A, the benefits and expenses curve intersects the contribution curve.
In terms of the lower part of the graph, this point A is where net provincial
cash flow equals zero**.

CPP BORROWING AND FUND DETERMINANTS UNDER CURRENT FINANCING CONDITIONS	FIGURE I

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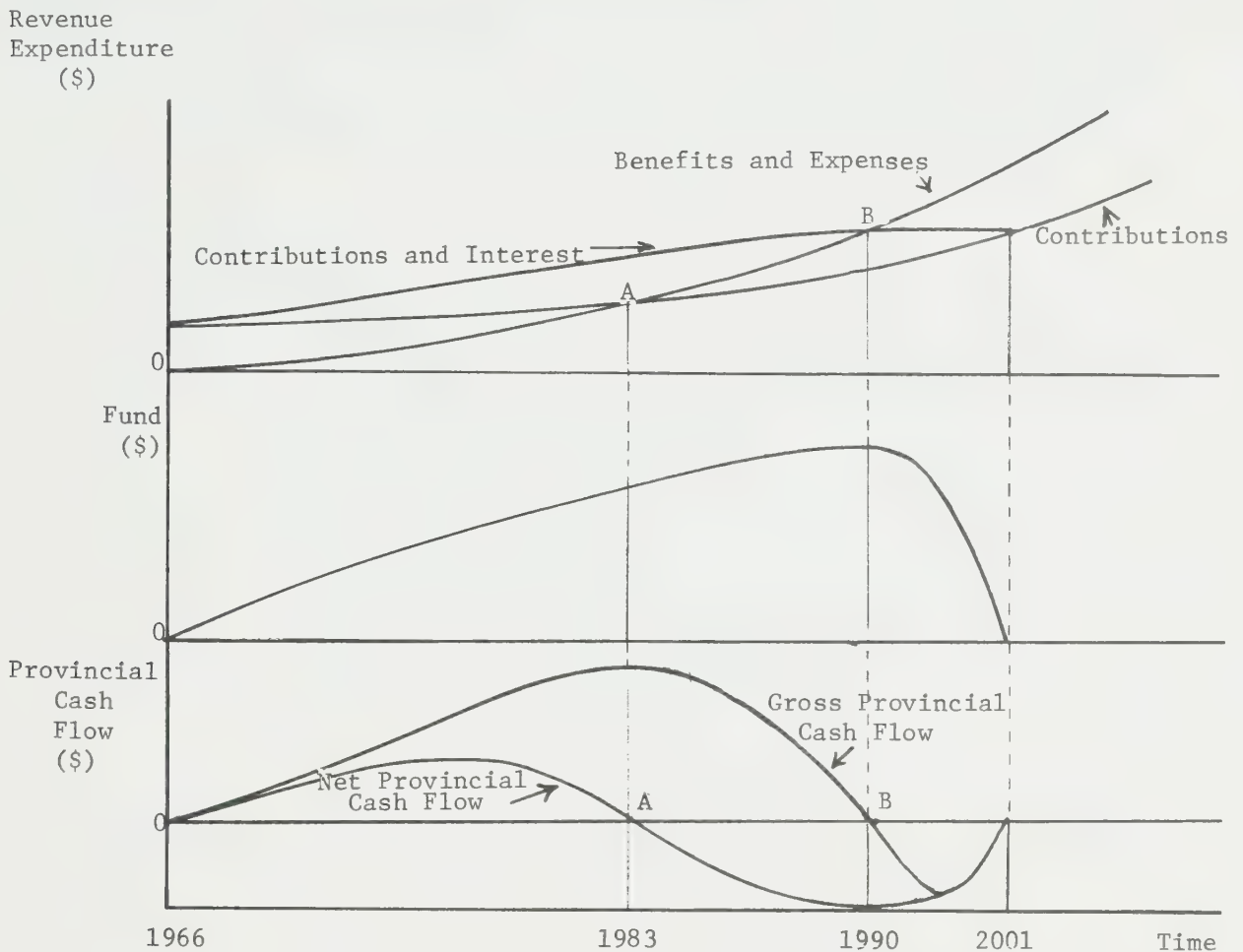
* The forecasts presented assume that subsequent to 1979:

  . average earnings grow at an annual average rate of 7.0 per cent

  . prices increase at an annual average rate of 5.0 per cent

  . interest rates average 7.0 per cent a year.

** Net provincial cash flow is defined as the gross borrowing of a province
   less the interest payments that must be paid on outstanding debt. This
   can be proven to be equivalent to the difference between contribution
   and expenditures. See Appendix A for all cash flow relationships.

If the contribution rate remains unchanged it is still possible to meet benefits and expenses payments until 2001, which are financed by running down the fund. Provinces would be obligated to repay outstanding CPP debentures before they were mature as the early recall feature would have to be exercised. The fund would peak in 1990 when the benefits and expenses curve intersects with the revenue (contributions plus interest) curve at point B. At this point gross provincial cash flow would not exist and net provincial cash flow would be negative by the amount of the interest payment on outstanding debt. Subsequently the fund runs down very rapidly and exhausts in 2001. The redemption of CPP debentures during the rundown of the fund would be at a much higher rate than the rate of accumulation during the period when contributions exceeded benefits and expenses.

c. The Funding Spectrum

As the Canada Pension Plan currently operates it is partially funded. The previous diagram showed that this will not be the situation for much longer. The best way to differentiate between the different funding systems is to examine them in terms of contribution rates. There is one common feature of the fully funded, partially funded and paygo financial structures. In the long run they all tend to converge to the same contribution rate, known as the equilibrium contribution rate. The following diagram demonstrates this characteristic.

POSSIBLE CONTRIBUTION STRUCTURES FOR THE CPP   FIGURE II
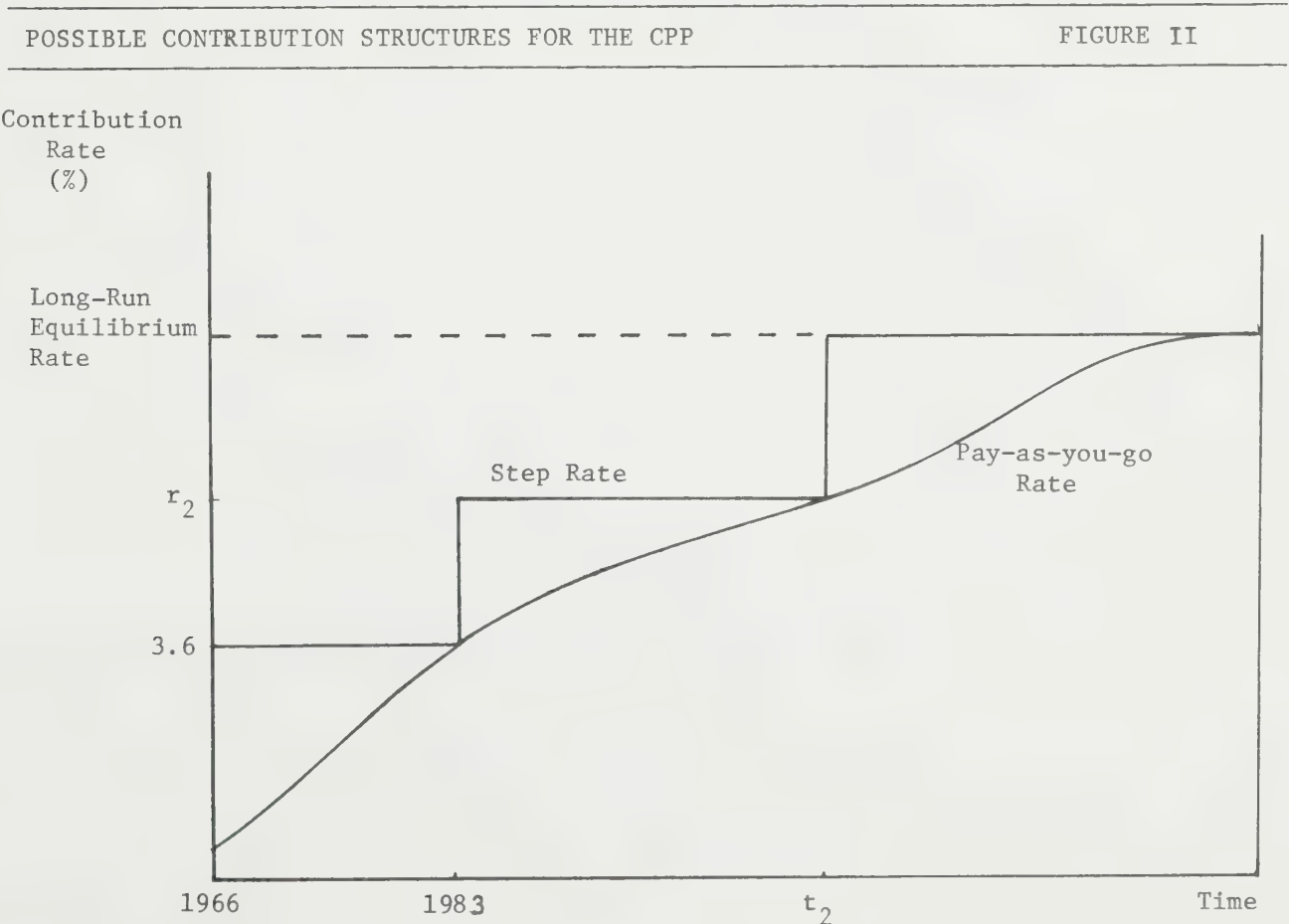
With the fully funded structure, the contribution rate never
changes unless there are unstable population, work force or unusual economic
conditions. This method of funding is sometimes known as level premium
funding simply because of the consistency in the contribution rate. A fully
funded plan, since the rate is always the long-run rate, results in each
beneficiary paying the actuarial share of his pension. Under this type of
system there are minimal intertemporal or intergenerational subsidies. As
well, a large fund builds up quickly since at the Plan's inception there
were few beneficiaries and many contributors. As the Plan approaches its
long-run equilibrium, the growth rate of the fund diminishes until its growth
is essentially a result of population and wage changes. The growth of the
fund can be visualized in the diagram as the difference between the fully
funded and the paygo rates.

At the other end of the funding spectrum is the paygo method. The
diagram shows that this type of pension plan operation relies on a steadily
increasing contribution rate. Basically, this method of funding structure
takes into account the fact that in the initial years there are few beneficiaries
but many contributors. Consequently, in the early years the contribution rate
is low since there are few benefits to fund. As more contributors become bene-
ficiaries, the contribution rate begins to rise in order to pay for the increas-
ing benefit expenditures. In the long run, the same equilibrium is reached as
with the fully funded method, the only difference being the accumulation of a
large fund*.

Another aspect which increases the cost and subsidies of the Plan
no matter which type of system is adopted, is the payment of liabilities
for those beneficiaries who have not been in the system long enough to pay for
their own benefits**. For example, anyone who retired during the first ten years
of operation of the CPP receives a retirement pension which is far in excess of
his contributions. In other words, the retiring individual is treated as if he
had been contributing much longer than he actually has. It is this liability,
that is unaccounted for by the contributor, that must be paid by other, younger
contributors. In a paygo plan, this transfer manifests itself in a higher future
contribution rate for younger contributors. The CPP contains a large body of

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* Interest is not used for financing benefits.
** In actuarial terms, these liabilities are known as past service credits.

contributors who were older than 18 at the inception of the Plan in 1966 and
who will not have completely paid for their benefits when they receive them.
Consequently, the internal financial mechanics of the Plan contain a large
body of unfunded liabilities relating to these future beneficiaries which must
be financed at some future date as the Plan matures*.

If the total deficiency related to those future beneficiaries was aggre-
gated and funded separately, the CPP contribution rate could be set at what is known
as the entry-age-normal-cost rate. This rate would never change since it is based
on the actual cost of benefits for each person as if they entered the Plan at some
constant age. The equilibrium rate under the three funding methods which are dis-
cussed here will be slightly higher than the normal cost rate since it must account
for the past service liabilities that have not been paid for.

A partially funded plan such as the CPP can function under any number
of contribution rate structures. The one presented in Figure II is a step
function. The situation that will occur in 1983 when the current 3.6 per cent
contribution rate line intersects the paygo contribution rate curve means that
the CPP at that time will be on a paygo basis. While raising the contribution
rate in the step function manner will shift the Plan back into a partially funded
structure, it will inevitably reach the same situation as it faces now, sometime
in the future. The provincial financing problem will continue to recur until
the equilibrium rate is attained. Once this point is attained net provincial
cash flow will be perpetually zero**.

At that date in the future when the equilibrium rate is reached so
that the fully funded and paygo rates are equivalent, the existence of a fund
will have to be justified. The situation faced then will be similar to that
which will occur in 1983, with one important difference. In 1983 the contri-
bution rate must be raised to continue to finance benefits; how much it is
raised will be a function of the desired degree of fundedness. In the distant
future when the long-run equilibrium rate is reached, there is no longer a
justification to raise the contribution rate, unless the CPP is to be an
alternative to raising taxes.

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* This is analogous to the concept of the initial unfunded liability.

** In this discussion the paygo contribution rate is based on contributions
exactly meeting expenditures. Interest earnings are not considered as a
revenue to the fund. The paygo rate, based upon contributions plus interest
exactly meeting expenditures, leads to similar results. The difference
between these two paygo structures is discussed in Appendix B.

The existence of a fund at this point in time could be argued, on the one hand, as being nothing more than the sum of money that did not have to come from the taxation system. On the other hand, its existence could be justified as the method that was used to mitigate intertemporal transfers. The point of the former argument is that the government could guarantee all future liabilities on the strength of its taxing power. The implications of the latter point will be more fully discussed in the following chapter.

d. Other Methods of Funding

The previous funding methods are conventional in terms of actuarial methods of funding. These funding systems do not alter the basic structure of the CPP other than raising the contribution rate and altering provincial cash flow and the rate of fund accumulation. A more radical departure from traditional funding systems would be a system much like the Old Age Security Fund which operated in Canada from 1951 to 1975. This fund initially depended upon earmarked surtaxes to finance the benefits paid out and operated as a paygo plan. After Bill C-259 was implemented, this special surtax was integrated into the new tax structure so that the tax relating to old age security expenditures became invisible. Subsequent to 1974-75 the separate Old Age Security fund was disbanded and the payments are now made directly from the consolidated revenue fund.

If the CPP operated in this manner, there would no longer be any need to have a separate contribution system or a fund. Individuals' earnings histories could be monitored from their annual taxation form. However, the CPP was designed to achieve other social objectives. These will be discussed in the next chapter.

V. IMPLICATIONS OF ALTERNATE FUNDING SYSTEMS

Fully Funded and Paygo Systems

The fully funded structure is probably the most appealing. There
is no worry on the part of contributors that they will not receive their
benefits and hence, lose their "savings". Contribution rates remain constant
and this nullifies the transfer between generations. The consistent contribu-
tion rate also aids pension planners in the private sector especially those
that are designing integrated plans. Funded pensions in one sense are less
expensive than unfunded ones since the interest earnings of the fund are a
part of revenue. As well, funding is a form of self-discipline, since it
restrains governments from enriching benefits without knowing the cost or
establishing a method for financing the benefits. Finally, a funded system is
not dependent upon a constant growth in the economy, population, or the work
force to maintain solvency.

Figure III examines the cash flow as if the CPP became fully funded
in 1983 when net provincial cash flow turns around.

CPP BORROWING AND FUND DETERMINANTS   FIGURE III
UNDER FULLY FUNDED ASSUMPTIONS
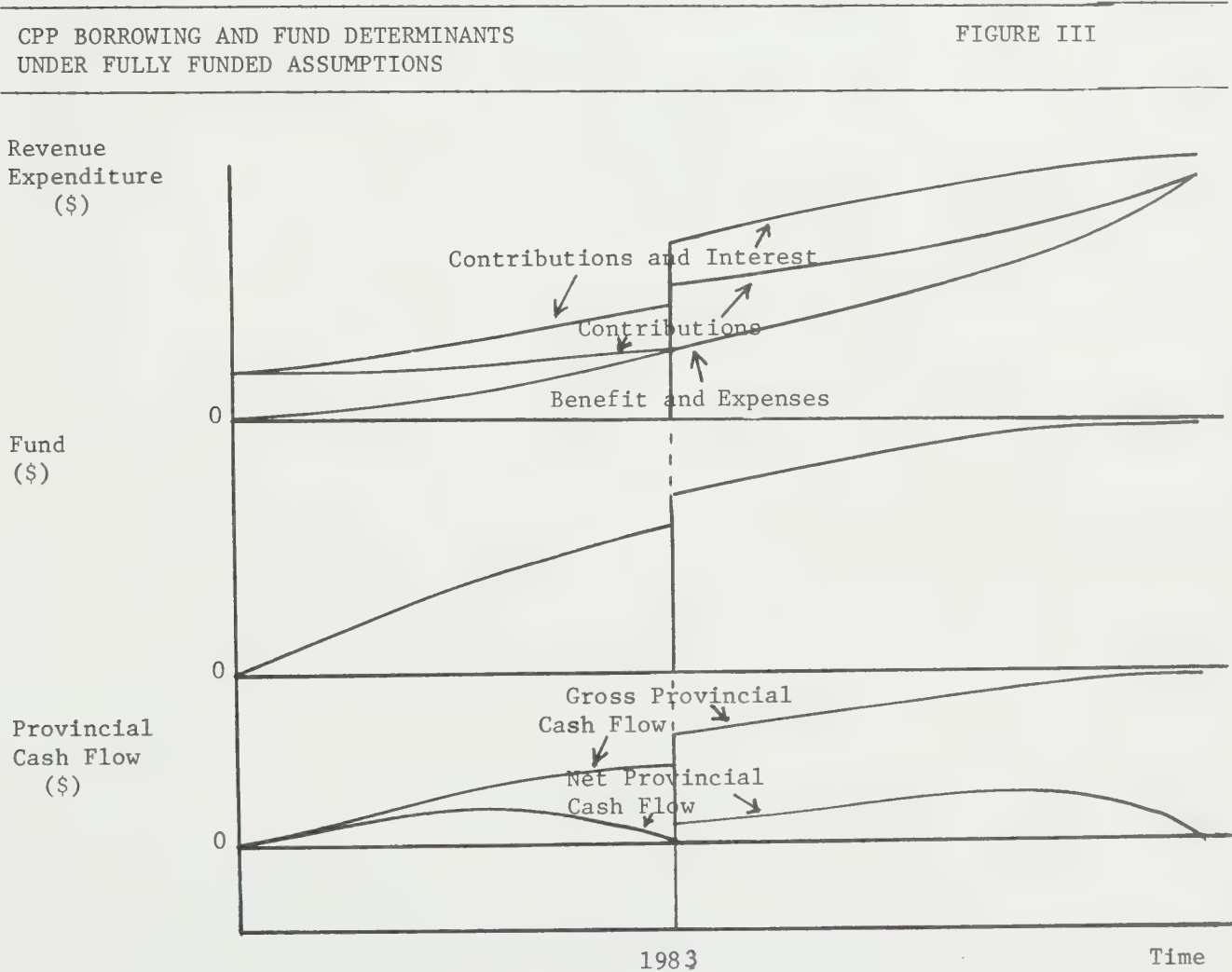
Until 1983 these diagrams are the same as those in Figure I. In 1983 when the rate is converted to the fully funded rate, all the revenue curves show large increases because of the enormous amount of funds generated by the increased contributions. However, in the long run, the curves begin to tend back to the same intersections as those that occurred in 1983. At this point in time net provincial cash flow would be zero again.

Table III indicates the fund magnitude under the fully funded assumptions. By 2025 the fund is so overwhelming in size it is difficult to grasp the significance of the figures*.

CONTRIBUTION RATES AND FUND ACCUMULATIONS UNDER DIFFERENT FUNDING ASSUMPTIONS						TABLE III
	Contribution Rate			Fund Accumulation**		
Year	Paygo Plan (%)	Partial Funding* (%)	Full Funding (%)	Current Funding ($M)	Partial Funding ($M)	Full Funding ($M)
1975	1.76	3.60	8.30***	8,454	8,454	22,294
1980	3.46	3.60	8.30	14,226	14,226	48,005
1985	4.00	5.60	8.30	19,229	27,887	91,974
1990	4.99	5.60	8.30	18,831	47,753	160,834
1995	5.71	7.60	8.30	5,561	74,125	261,817
2000	6.05	7.60	8.30	–	135,158	411,961
2005	6.18	7.60	8.30	–	231,124	639,495
2010	6.36	7.60	8.30	–	380,829	983,558
2015	6.92	7.60	8.30	–	591,760	1,481,119
2020	7.59	8.30	8.30	–	855,939	2,167,123
2025	8.30	8.30	8.30	–	1,237,501	3,077,002

* Assumes contribution rates increase by 2 percentage points when net provincial cash flow becomes zero.

** With paygo funding no fund is generated.

*** The paygo rate in 2025, the limit of the forecast is 8.3 per cent and still growing, though at a slower rate. Figures are based on federal forecasts.

* For comparison purposes, it is interesting to note that the CPP fund in 2025 will be roughly equivalent to the outstanding liabilities of the OASDHI system in 1975.

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The accumulation of such a large fund is one of the results of mitigating intergenerational or intertemporal transfers.

If the CPP were fully funded from the beginning, the amount of subsidy would be minimized*. With the current partially funded rates, subsidies become a very obvious part of the plan structure. For example, consider two individuals, one who contributes at a fully funded rate of 7.2 per cent over his lifetime and another who begins contributing at 3.6 per cent but each year the rate rises by some constant amount so that they both are paying the same rate when they retire**. The former individual will pay one-third more in contributions than the latter one and yet they would both receive the same pension. The subsidy for the latter individual must be financed by future contributors to the Plan. In other words, income redistribution would occur from younger to older members and this redistribution would continue until the Plan fully matures.

Therefore, one of the questions that must be discussed is the extent to which these subsidies will be allowed to occur. If this "pact between generations" is deemed to be socially desirable then the CPP could be oriented to a paygo plan. If this is not the case, then other questions arise. For example, if the intertemporal transfers were not considered to be a desirable feature of the CPP then it necessarily would have to be oriented to a fully funded structure.

The fully funded plan would be a boon to provincial financing for a number of years to come. However, raising the contribution rate to such a high level would have an adverse impact on personal voluntary savings. Since disposable income would fall, there would also be a similar drop in personal savings, the actual drop being related to the marginal propensity to save.

The drop in savings would be equal to the amount of money transferred from the private sector to the public sector by the introduction of the higher rate. At the same time, there could be an offsetting influence if provinces reduced or held their tax levels. A transfer of capital this large would have a profound impact on capital markets. As private funds became scarce, interest rates would rise which would lead to a slowdown of the rate of accumulation of private capital

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* Past service costs would still be causing same subsidies among contributors.

** The second individual's contribution rate would increase by .078 percentage points a year.

stock at a time when the demand for long-term capital will be at its greatest. This in turn would affect productivity and international competitiveness. The only safe way to utilize the rapid accumulation of funds would be to invest them in the private sector which would require a significant change in the operation of the CPP investment fund.

Under a paygo or partially funded system the cost of a pension will be a bargain for those who are fortunate enough to be contributing in the early years of the Plan. Cheaper pensions in the public sector mean that individuals and firms offering private plans can use the savings to enrich pension income at retirement through the private market. If the difference between benefits and the actual cost of the pension is not channelled completely into other savings mechanisms, it will increase consumption. In any event, the money remains in the private sector.

Since under the paygo system, net provincial borrowing from the CPP will no longer exist, provincial governments, if they desire to maintain their level of expenditure growth, will have to go elsewhere for their financing. Raising taxes to finance expenditures will have a similar impact on the private sector although there will not be identical implications. However, if the provinces compete for funds directly in the marketplace, there are obvious advantages for the larger provinces. In either case, if the provinces need the capital when the CPP is no longer a source of funds, the impact on the markets would be similar to the situation where the funds come from the CPP.

Apart from the subsidies inherent in the financing structures des-cribed above, there will always be inequitable subsidies in the CPP as a result of the year's basic exemption (YBE), the year's maximum pensionable earnings (YMPE) and the taxation system. The following diagram and table clearly illus-trate this point.

The nominal* CPP tax rate is progressive up to the YMPE because of the existence of the YBE since the exemption means less in relative terms as incomes rise. Above the YMPE, the nominal tax rate falls since contributions remain constant and therefore, claim a smaller share of income as it rises. By juxtaposing the nominal tax rate on the personal income tax system, because of the deductibility of CPP contributions, a roller-coaster tax incidence pattern results. The effective contribution rate for the CPP very much favours high income earners.

* In this case, the nominal tax rate is CPP employee contributions, at 1.8 per cent, expressed as a percentage of earned income.

Earned Income ($)	CPP Contribution ($)	Nominal CPP Tax Rate (%)	Marginal PIT Rate* (%)	Effective CPP Contributions ($)	Effective Contribution Rate ($)
1,000	3.60	0.36	0	3.60	0.36
2,000	21.60	1.08	0	21.60	1.08
3,000	39.60	1.32	0	39.60	1.32
4,000	57.60	1.44	24.79	43.32	1.08
5,000	75.60	1.51	24.79	56.86	1.14
6,000	93.60	1.56	26.10	69.17	1.15
7,000	111.60	1.59	27.40	81.02	1.16
8,000	129.60	1.62	27.40	94.09	1.18
8,300	135.00	1.63	27.40	98.01	1.18
9,000	135.00	1.50	27.40	98.01	1.09
10,000	135.00	1.35	30.02	94.47	0.94
15,000	135.00	0.90	33.08	90.34	0.60
20,000	135.00	0.67	37.97	83.74	0.42
30,000	135.00	0.45	45.67	73.35	0.24

INCIDENCE PATTERN OF THE CPP PAYROLL TAX FOR 1976 — TABLE IV

* Assumes a provincial PIT rate of 30.5 per cent. For provinces with higher rates, the pattern of regressivity is further pronounced. Individuals represented in this table are single and claim all the standard deductions. Tax reductions for 1976 are included.

EFFECTIVE CPP CONTRIBUTION RATE, 1976 — FIGURE IV
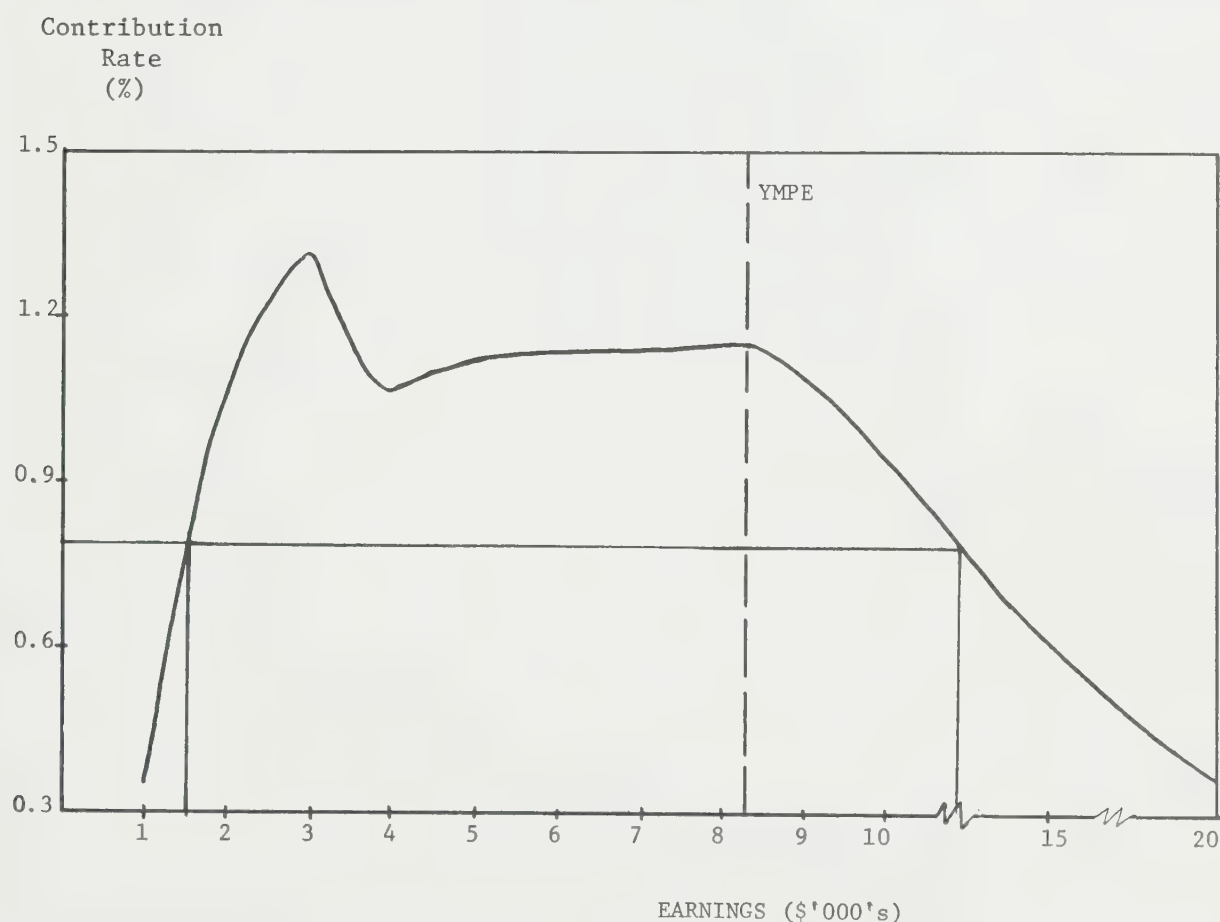
For instance, the individual earning $1,500 a year in 1976 faces the same effective contribution rate as the individual earning $12,000, however, the difference in benefits they would receive from the CPP would be enormous. The individual earning around $3,000 is the one who suffers the most. If the CPP contribution rate is assumed to be the fully funded rate, the pattern of regressivity is much more pronounced.

If the future benefit is considered as well but in relative terms, the effective contribution rate is not as inequitable as implied by regarding the benefit in an absolute sense. It can be shown that the rate of return for every dollar invested in the CPP at different income levels does not exhibit the same roller-coaster pattern.

However, this is not the point that is being addressed. Inasmuch as the CPP provides an alternate source of provincial financing and may continue to do so in the years to come, it is very inequitable to build a financing structure on a regressive tax base. While some of the cash flow to the CPP will be used to finance benefits in an equitable, earnings-related manner, it is the residual that is borrowed by the provinces which causes the inequities.

One way around this problem is to fund the CPP from the consolidated revenue fund like old age security and guaranteed income supplement payments. However, this would remove an important aspect of the CPP; that it is a contributory plan. It is important in an earnings-related, contributory plan that contributors have a visible tax that is related to a future benefit. In this way the Plan incorporates a clear incentive to work and to contribute to a retirement pension.

VI. THE ROLE OF THE INTEREST RATE

In a recent study* the CPP Advisory Committee has questioned the
current method of determining the rate of interest charged to the provinces
on funds borrowed from the CPP Investment Fund. Essentially, the criticisms
concern the relevance of the current method of determining the rate, in light
of changes in the federal debt structure, and the fact that the rate is
generally below that which the provinces would pay on the open market.

As pointed out earlier, the interest rate charged is a weighted
average of yields for the first three days of a given month on Government of
Canada bonds with twenty years or more to maturity. These long-term bonds
make up a very small proportion of the outstanding debt of the Government of
Canada, having decreased from 5.1% in 1964 to 1.0% in 1974. However, most of
the criticism centers around the low rate of return being earned by the fund
due to the rate of interest being charged to the provinces.

Some of the advantages of CPP bonds are in the nature of a mixed
blessing. On the one hand, the report states that, "the consistency of CPP cash
flow has meant that provincial treasurers can count on CPP funds at times when
public debt markets are in disarray"**. On the other hand, provincial treasurers
have no control of cash flow from the CPP. They must take it when it becomes
available or forego the money altogether. Combined with the very seasonal
nature of the CPP cash flow and the inconsistent forecasts of fiscal year
flows, the effect is that provincial debt financing often has to accommodate
CPP borrowing, rather than being able to choose when to borrow.

This is only one reason why CPP interest rates cannot be compared to
those on the open market. Since CPP bonds are not marketable and are always
valued at par, the rate of return is more stable and there is no chance of capital
losses. Furthermore, there is no default risk associated with these instruments,
a characteristic usually reflected by a lower rate of return. Unlike normal
bonds, the term of CPP bonds is not fixed, because of the recall feature. Whether
it is exercised or not, its existence makes the CPP bond less desirable than a
regular bond.

These considerations make the CPP bonds inferior debt instruments to
regular market bonds, a fact which is recognized by the lower interest rate. The

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* Advisory Committee of the Canada Pension Plan, The Rate of Return on the
   Investment Fund of the Canada Pension Plan, June 1975.

** Ibid, p. 8

lender, the CPP, has invested in a stable, virtually risk-free instrument which can be redeemed whenever it is necessary. The borrowers, the provinces, assume the risk of having the bonds recalled on short notice. If the interest rate payable on CPP bonds were equal to the market rate, this form of borrowing would be less attractive to the provinces because of these negative qualities.

At first glance, the effect on the fund of a 1.0% increase in the interest rate appears to be substantial. However, the absolute magnitude of the fund is a meaningless concept until the fund begins to run down, at which point it would become one of the determinants of the length of time until the fund is exhausted. As long as the fund is increasing, it represents only the accumulation of gross provincial cash flow. The dynamic effect of an increased interest rate is an increased flow of cash to the fund, which increases gross provincial cash flow. Since the provinces are paying more interest, but are borrowing this money back again, there is no effect on net cash flow.

	Paygo Rate		
Year	Current Interest Rate Assumptions* (%)	1.0% Increase in Interest Rate (%)	Difference
1980	1.97	1.60	.37
1985	2.84	2.48	.36
1990	4.14	3.80	.34
1995	5.14	4.91	.23
2000	5.67	5.52	.15
2005	5.92	5.82	.10
2010	6.19	6.12	.07
2015	6.80	6.75	.05
2020	7.51	7.48	.03
2025	8.24	8.22	.02

IMPACT OF INCREASED INTEREST RATE ON
PAYGO RATE INCLUDING INTEREST   TABLE V

* Actual rates are used to 1975 and 7.0% is assumed thereafter.

The advisory report suggests that a higher rate of return on investments would mean a lower future contribution rate. This would be true under some circumstances but not others. Under a paygo system including interest as a source of revenue, the interest rate is an important variable. However, under a paygo system without interest, the interest rate is unimportant as outlined above. Appendix B clarifies this important difference. Even in a paygo system including interest, the decrease in the contribution rate is relatively minor. The preceding table shows two sets of paygo rates including interest, with the second column reflecting an interest rate that is always one percentage point higher.

The impact on the Provinces' balance sheet, however, is considerable. Although the net cash flow is unaffected, budgetary expenditures on interest payments are increased and the change in the debt outstanding is significant. Both these effects are cumulative and worsen over time.

The whole question of changing the determination of the interest rate on the CPP investment fund should be included in the broader question of developing a new financial structure for the CPP.

VII. SUMMARY OF POLICY ISSUES

The basic issue that must be resolved in the course of future discussions is the role that the Canada Pension Plan should play in provincial financing. The extent of this role will determine the type of funding system that will be required. However, any funding system that is chosen results in compromises among other objectives.

If provincial financing is no longer considered a primary objective, then a paygo plan could be adopted, but at the sacrifice of equity among different ages of contributors. If provincial financing is considered a necessary facet of the Plan, it could be achieved by a partially or fully funded structure which results in the financing being based on a regressive tax system.

Whichever of the conventional funding systems is chosen, provincial financing will eventually run down as the CPP matures. Within the next two to three years net provincial cash flow will begin to decline which will place the provinces in the position of having to increase their financing from other sources. One source could be the CPP but this decision is one that must be made by the provinces participating in the Plan.

APPENDIX A

CPP Cash Flow Relationships

CPP Cash Flow Relationships

C	=	Contributions
B	=	Benefits
E	=	Expenses of Administration
I	=	Interest (accounts for redemptions)
F	=	Fund
CE	=	Contributory Earnings
NR	=	Net Revenue
TR	=	Total Revenue
GPCF	=	Gross Provincial Cash Flow
NPCF	=	Net Provincial Cash Flow
LRPM	=	Loan Repayments (maturing)
LRPE	=	Loan Repayments (early recall)

Total Revenue

$$TR \quad = \quad C + I + LRPM + LRPE$$

Net Revenue

$$
\begin{aligned}
NR \quad &= \quad TR - (B + E) \\
&= \quad C + I + LRPM + LRPE - (B + E) \\
&= \quad GPCF
\end{aligned}
$$

Gross Provincial Cash Flow

1. GPCF > 0   iff
    (C + I + LRPM) > (B + E)
    then
    GPCF = (C + I + LRPM) - (B + E)

2. GPCF < 0   iff
    (C + I + LRPM) < (B + E)
    then
    GPCF = LRPE
    $\quad\;\;$ = (B + E) - (C + I + LRPM)

Net Provincial Cash Flow

NPCF = GPCF - I - LRPM - LRPE
$\quad\;\;$ = C - (B + E)

Early Recall of Outstanding Loans

LRPE = 0   iff

(C + I + LRPM) > (B + E)

LRPE > 0   iff

(C + I + LRPM) < (B + E)
then
LRPE = (B + E) - (C + I + LRPM)

Fund Accumulation

$$F_t = \sum_{i=1}^{t} (NR - LRPM - LRPE)_i$$

<u>Derivation of the Paygo Rate (without Interest)</u>

CE = C ÷ .036

Paygo Rate = (B + E) ÷ CE

<u>Derivation of Critical Points</u>

1. NPCF =   0 when
       C =   B + E and
    GPCF =   max.

2. GPCF =   0 when
    C + I =   B + E and
    F_t =   max.

3. F_t =   0 when
    C+ I =   C   (I = 0)   and
    NPCF =   GPCF = 0

All relationships expressed here are simple forms of more complex functions. These relationships should be viewed as approximating real world situations since lags in interest payments, etc. are ignored.

APPENDIX B

The Inclusion of Interest

in the Calculation of The Paygo Rate

The Inclusion of Interest in the Calculation
of the Paygo Rate

Throughout the body of this paper the paygo rate has been defined as the ratio of benefits (B) plus expenses (E) to contributory earnings (CE), or the percentage of contributory earnings required to finance benefits and expenses for that year.

$$\text{Paygo Rate} = \frac{(B+E)}{CE} \qquad (1)$$

If interest (I) is explicitly recognized as a revenue to the plan, it is possible to formulate an alternative definition of the paygo rate which takes account of interest revenues to offset expenditures. Thus, the alternative form of the paygo rate would be the ratio of benefits and expenses less interest revenue, to contributory earnings.

$$\text{Paygo Rate} = \frac{(B+E) - I}{CE} \qquad (2)$$

The difference in these two definitions of the paygo rate has important consequences for provincial borrowing. If the CPP contribution rate were set equal to the definition in (1), every year there would be a surplus to the CPP equal to the interest paid on previous borrowings by the provinces. This surplus would be lent to the provinces, creating a positive gross cash flow equal to the interest, though exactly offset by the interest payments yielding a net cash flow of zero. Although the net cash flow would be zero, the provinces would be borrowing to pay the interest and thus, outstanding debt to the CPP would be increasing due to the positive gross cash flow. If, on the other hand, the other definition of paygo rate (2) were used, interest revenue would be taken into consideration in determining the contribution rate and there would be no surplus accruing to the CPP*. Thus, gross cash flow to the provinces would be zero and net cash flow would be negative by the amount of the annual interest payments. In this case provinces must make interest payments from other revenue sources, but debt outstanding to the CPP remains constant (or diminishes by the amount of bond maturations or early recall). These two cases can also be explained by reference to Figure B.

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* This analysis ignores small surpluses and deficits due to slight inaccuracies in forecasting future benefits and expenses.

CPP BORROWING AND FUND DETERMINANTS UNDER   FIGURE B
ALTERNATIVE PAYGO RATE DEFINITIONS

Revenue
Expenditure
    ($)

(a) Without Interest   (b) With Interest
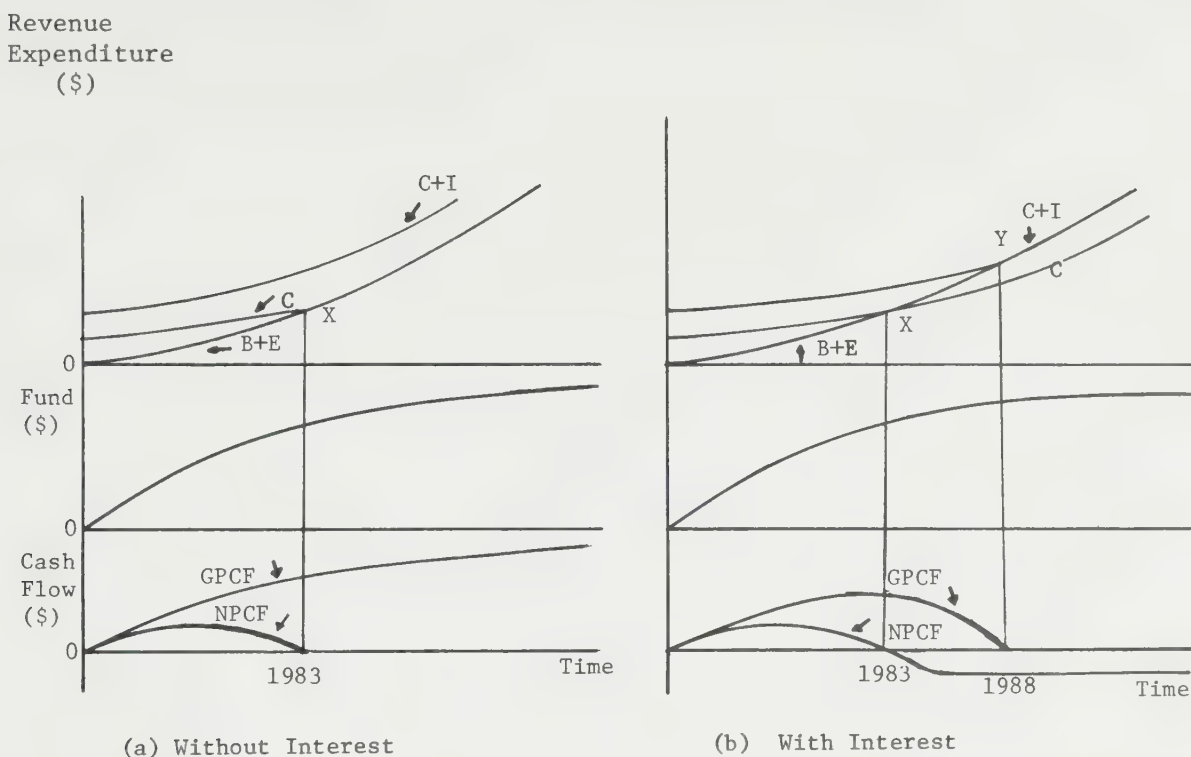
   In Figure B (a) the contribution curve intersects the benefits and

expenses curve at point X in 1983. From then on the two are coincident since

the contribution rate is defined so that contributions are always equal to

benefits and expenses. The contributions plus interest curve continues to

rise and is always higher than the benefits and expenses curve, since each

year more interest revenue is generated. The other two diagrams in Figure B

(a) show the increasing fund and gross cash flow, and the zero net cash flow.

   Figure B (b) illustrates the case where interest is included and shows

the contributions plus interest curve becoming coincident with the benefits and

expenses curve at point Y in 1988. The fund remains constant and gross

cash flow is zero, while net cash flow is negative and constant.

   In the short run, the difference in the two definitions will manifest

itself in a lower contribution rate when interest is included. However, in the

long run both definitions approach the equilibrium rate. Definition (2), with zero

gross cash flow to the provinces, will yield a lower contribution rate in the

earlier years, but as the cost of benefits increase, interest payments remain the

same, requiring contributions to finance an increasing percentage of the expenses,

until the interest payments become proportionately insignificant.

APPENDIX C

PENSIM Forecasts

of CPP Cash Flow

PENSIM Projections of Cash Flow Components Under the Current Plan (Canada less Quebec)
($ million)

Calendar Year	Contributions	Interest	Loan Repayments	Total Revenue	Benefits and Expenses	Net Revenue	Fund at Year End	Net Provincial Cash Flow
1975	1346.2	570.4	0.0	1916.6	605.3	1311.3	9348.6	740.9
1976	1520.8	698.9	0.0	2219.7	779.3	1440.4	10833.0	741.6
1977	1720.1	835.7	0.0	2555.8	1063.2	1492.6	12380.2	656.9
1978	1941.1	970.0	0.0	2911.2	1370.8	1540.4	13975.4	570.3
1979	2198.1	1101.0	0.0	3299.1	1696.3	1602.8	15630.8	501.8
1980	2450.6	1229.2	0.0	3679.8	2186.8	1492.9	17192.5	263.7
1981	2791.0	1333.7	0.0	4124.7	2558.0	1566.7	18804.4	233.0
1982	3088.7	1443.4	0.0	4532.1	2969.8	1562.3	20423.2	118.9
1983	3433.4	1552.7	0.0	4986.1	3435.0	1551.1	22032.6	- 1.6
1984	3764.2	1661.3	0.0	5425.5	3913.5	1512.0	23606.8	- 149.3
1985	4292.7	1767.2	0.0	6059.8	4537.2	1522.6	25186.4	- 244.5
1986	4657.5	1873.7	383.3	6914.5	5157.0	1757.5	26637.9	- 499.5
1987	5091.0	1975.9	764.5	7831.3	5843.3	1988.0	27938.5	- 752.3
1988	5496.9	2072.3	718.7	8288.0	6593.7	1694.2	28997.7	-1096.8
1989	5949.0	2143.5	818.0	8910.5	7385.3	1525.3	29783.6	-1436.2
1990	6449.8	2190.0	895.9	9535.7	8321.5	1214.1	30186.1	-1871.8
1991	6968.4	2203.6	960.4	10132.3	9289.6	842.7	30151.0	-2321.3
1992	7541.7	2195.8	1012.9	10750.4	10347.7	402.7	29620.5	-2806.0
1993	8154.6	2150.8	1477.8	11783.2	11488.1	295.1	28521.3	-3333.5
1994	8817.7	2092.2	2332.0	13239.8	12706.3	533.5	26810.0	-3888.6
1995	9529.3	2021.1	3059.0	14609.3	14044.3	565.0	24409.8	-4515.0
1996	10328.4	1932.1	3530.8	15791.3	15464.6	326.7	21295.3	-5136.2
1997	11169.1	1818.2	5501.6	18488.8	16981.9	1506.9	17421.4	-5812.8
1998	12123.4	1789.3	4804.8	18717.5	18600.3	117.2	12832.7	-6476.9
1999	13168.0	1666.6	6305.7	21140.4	20328.3	812.0	7456.6	-7160.3
2000	14293.5	1595.2	6926.8	22815.6	22178.0	637.5	1296.6	-7884.5
2001	15516.5	1535.3	637.5	17689.4	24196.9	- 6507.5	-	-8680.4
Variables	C	I	LRPM + LRPE	TR	B + E	NR = GPCF	F_t	NPCF